

Paediatric Critical Care Intravenous Infusion Chart – Preparation and Flow Rate Calculation Guidance

For use by centers without access to the CHI Paediatric Standard Concentration Infusion Smart-Pump Drug Library

All infusions compatible with Glucose 5% w/v and Sodium Chloride 0.9% w/v unless specified below dilution instructions • Weight (Wt) always in kg • See final page for examples

Formula for calculating infusion rate (mL/hour) - may be based on either a standard or an individualised weight-based concentration.
See explanatory notes at the end of this document, including how to adjust rate for different doses

Drug	Patient weight	Dilution Instructions	Standard Concentration Infusion		Individualised Weight-Based Concentration	Typical Dose Range +/- Special Considerations
			Suggested Start Dose	Rate calculation for Suggested Start Dose		
Adrenaline (Central Line) <i>May be initiated via peripheral line in an emergency pending placement of central access</i>	≤10kg	0.3mg/kg diluted to 50mL			1mL/hour = 0.1 microgram/kg/min	0.01- 0.1 microgram/kg/min
	>10kg	3mg diluted to 50mL (1mL = 60 microgram)	0.05 microgram/kg/min	(0.05 x Wt) mL/hour		Max dose:1.5 microgram/kg/min
Amiodarone (Central Line)	≥2* - ≤40kg	15mg/kg diluted to 50mL Glucose 5% w/v ONLY			1mL/hour = 5 microgram/kg/min	Step 1: Load (if required) 5 mg/kg over 1-4 hours Max dose 300mg
	>40kg	600mg diluted to 50mL (1mL = 12mg) Glucose 5% w/v ONLY	5 microgram/kg/min	(0.025 x Wt) mL/hour		Step 2: Maintenance 5-15 microgram/kg/min continuous IV infusion
Amiodarone (Peripheral Line)	All weights	300mg diluted to 250mL (1mL = 1.2mg) Glucose 5% w/v ONLY	5 microgram/kg/min	(0.25 x Wt) mL/hour		Max dose 1200mg/24hours (including load where given) <small>* minimum stable concentration = 0.6mg/mL</small>
Aminophylline (Central or Peripheral Line)	All weights	500mg diluted to 500mL (1mL = 1mg)	0.5 mg/kg/hour	(0.5 x Wt) mL/hour		0-1 mg/kg/hr
Atracurium (Central or Peripheral Line)	All weights	Use neat (1mL = 10mg)	300 microgram/kg/hour	(0.03 x Wt) mL/hour		300-1800 microgram/kg/hour Higher doses may be required to ensure neuromuscular blockade. Ensure adequate ventilation and sedation.
Dinoprostone (Central or Peripheral Line) <i>click here for full preparation instructions</i>	≤10kg	50 microgram diluted to 50mL (1mL = 1microgram) Glucose 5% w/v preferred	5 nanogram/kg/min	(0.3 x Wt) mL/hour		5-10 nanogram/kg/min; may be increased up to 20 nanogram/kg/min.

Paediatric Critical Care Intravenous Infusion Chart – Preparation and Flow Rate Calculation Guidance

For use by centers without access to the CHI Paediatric Standard Concentration Infusion Smart-Pump Drug Library

All infusions compatible with Glucose 5% w/v and Sodium Chloride 0.9% w/v unless specified below dilution instructions • Weight (Wt) always in kg • See final page for examples

			Flow Rate Calculation			
Drug	Patient weight	Dilution instructions	Standard Concentration Infusion		Individualised Weight-Based Concentration	Typical Dose Range +/- Special Considerations
			Suggested Start Dose	Rate calculation for Suggested Start Dose		
Dobutamine (Central Line)	≤15kg	15mg/kg diluted to 50mL			1mL/hour = 5 microgram/kg/min	2-20 microgram/kg/min
	>15kg	250mg diluted to 50mL (1mL = 5mg)	5 microgram/kg/min	(0.06 x Wt) mL/hour		
Dobutamine (Peripheral Line)	All weights	75mg diluted to 50mL (1mL = 1.5mg)	5 microgram/kg/min	(0.2 x Wt) mL/hour		
Dopamine (Central Line)	≤15kg	15mg/kg diluted to 50mL			1mL/hour = 5 microgram/kg/min	2-20 microgram/kg/min
	>15kg	250mg diluted to 50mL (1mL = 5mg)	5 microgram/kg/min	(0.06 x Wt) mL/hour		
Dopamine (Peripheral Line)	All weights	75mg diluted to 50mL (1mL = 1.5mg)	5 microgram/kg/min	(0.2 x Wt) mL/hour		
Glyceryl Trinitrate (Central Line)	≤15kg	3mg/kg diluted to 50mL			1mL/hour = 1 microgram/kg/min	Initially 0.2-0.5 microgram/kg/min. Adjust dose according to patient's response.
	>15kg	50mg diluted to 50mL (1mL = 1mg)	1 microgram/kg/min	(0.06 x Wt) mL/hour		Usual dose 1-3 microgram/kg/min. Max dose: 10 microgram/kg/min (Do not exceed 200 microgram/min)

Paediatric Critical Care Intravenous Infusion Chart – Preparation and Flow Rate Calculation Guidance

For use by centers without access to the CHI Paediatric Standard Concentration Infusion Smart-Pump Drug Library

All infusions compatible with Glucose 5% w/v and Sodium Chloride 0.9% w/v unless specified below dilution instructions • Weight (Wt) always in kg • See final page for examples

			Flow Rate Calculation			
Drug	Patient weight	Dilution instructions	Standard Concentration Infusion		Individualised Weight-Based Concentration	Typical Dose Range +/- Special Considerations
			Suggested Start Dose	Rate calculation for Suggested Start Dose		
Labetalol (Central Line)	All weights	Use neat i.e. 250mg in 50mL (1mL = 5mg)	0.5 mg/kg/hour	(0.1 x Wt) mL/hour		0.5 mg/kg/hour adjusted at intervals of at least 15 minutes to response.
Labetalol (Peripheral Line)	All weights	50mg diluted to 50mL (1mL = 1mg)	0.5 mg/kg/hour	(0.5 x Wt) mL/hour		Max dose: Neonates: 4 mg/kg/hour 1 month-12 years: 3 mg/kg/hour 12-18 years: 30-120 <u>mg</u> /hour (<u>not</u> mg/ <u>kg</u> /hour for 12-18 years)
Midazolam (Central Line)	All weights	3mg/kg diluted to 50mL			1mL/hour = 1 microgram/kg/min	Sedation: 0-4 microgram/kg/min Status Epilepticus: 0-24 microgram/kg/min
Midazolam (Peripheral Line)	≤15kg	3mg/kg diluted to 50mL			1mL/hour = 1 microgram/kg/min	
	>15kg	50mg diluted to 50mL (1mL = 1mg)	1 microgram/kg/min	(0.06 x Wt) mL/hour		
Milrinone (Ideally via Central Line; use Peripherally with care)	≤30kg	1.5mg/kg diluted to 50mL			1mL/hour = 0.5 microgram/kg/min	0.5-0.75 microgram/kg/min
	>30kg	Use neat 50mg in 50mL (1mL = 1mg)	0.5 microgram/kg/min	(0.03 x Wt) mL/hour		

Paediatric Critical Care Intravenous Infusion Chart – Preparation and Flow Rate Calculation Guidance

For use by centers without access to the CHI Paediatric Standard Concentration Infusion Smart-Pump Drug Library

All infusions compatible with Glucose 5% w/v and Sodium Chloride 0.9% w/v unless specified below dilution instructions • Weight (Wt) always in kg • See final page for examples

			Flow Rate Calculation			
Drug	Patient weight	Dilution instructions	Standard Concentration Infusion		Individualised Weight-Based Concentration	Typical Dose Range +/- Special Considerations
			Suggested Start Dose	Rate calculation for Suggested Start Dose		
Morphine (Central or Peripheral Line)	All weights	1mg/kg diluted to 50mL (max conc: 1mg/mL)			1mL/hour = 20 microgram/kg/hour	5-20 microgram/kg/hour May cause respiratory depression; monitor vital signs
NorAdrenaline (Central Line) <i>May be initiated via peripheral line in an emergency pending placement of central access</i>	≤10kg	0.3mg/kg diluted to 50mL			1mL/hour = 0.1 microgram/kg/min	0.01-0.1 microgram/kg/min
	>10kg	3mg diluted to 50mL (1mL=60 microgram)	0.05 microgram/kg/min	(0.05 x Wt) mL/hour		Adjust according to response Max dose:1 microgram/kg/min
Salbutamol (Central or Peripheral Line)	All weights	10mg diluted to 50mL (1mL = 200 micrograms)	1 microgram/kg/min	(0.3 x Wt) mL/hour		0-5 microgram/kg/min Caution exceeding adult dosing of 3-20 microgram/min (not microgram/kg/min)
Sodium Nitroprusside (Central Line)	≤15kg	3mg/kg diluted to 50mL Glucose 5% w/v ONLY			1mL/hour = 1 microgram/kg/min	0.5-8 microgram/kg/min
	>15kg	50mg diluted to 50mL (1mL = 1mg) Glucose 5% w/v ONLY	1 microgram/kg/min	(0.06 x Wt) mL/hour		Max dose: 4 microgram/kg/min if for >24hours Protect from light
Vasopressin (Central Line)	≤15kg	3 units/kg diluted to 50mL			1mL/hour = 1 milliunit/kg/min (NB 1milliunit = 0.001units) (1000 milliunits = 1 unit)	0.3-4 milliunits/kg/min (= 0.0003 -0.004 units/kg/min)
	>15kg	50 units diluted to 50mL (1mL = 1000 milliunits = 1 unit)	0.5 milliunits/kg/min	(0.03 x Wt) mL/hour		(NB 1 milliunit = 0.001 units) (1000 milliunits = 1 unit)

Paediatric Critical Care Intravenous Infusion Chart – Preparation and Flow Rate Calculation Guidance

For use by centers without access to the CHI Paediatric Standard Concentration Infusion Smart-Pump Drug Library

All infusions compatible with Glucose 5% w/v and Sodium Chloride 0.9% w/v unless specified below dilution instructions • Weight (Wt) always in kg • See final page for examples

Flow Rate Calculation		
Standard Concentration Infusion		Individualised Weight-Based Concentration
Suggested Start Dose	Rate calculation for Suggested Start Dose	

Rate calculator if not delivering suggested start dose:

$$\frac{\text{Required Dose} \times \text{Default Rate (mL/hour)}}{\text{Suggested Start Dose}}$$

Example of rate calculation using Standard Concentration Infusion

A 17kg patient with a peripheral intravenous catheter is prescribed a Dopamine infusion

1. Prepare 75mg / 50mL final volume* NaCl 0.9%w/v as per table

(*Final volume = Neat medication volume + Diluent volume)

For this infusion:

$$\text{Dopamine } 40\text{mg/mL} = 1.9\text{mL}$$

$$\& \text{ NaCl } 0.9\%w/v = 48.1\text{mL}$$

$$\text{Final volume} = 50\text{mL}$$

2. Calculate the 'Default rate' when delivering the 'Suggested start dose'

$$(0.2 \times \text{Wt}) \text{ mL/hour} = 5 \text{ microgram/kg/min}$$

$$(0.2 \times 17) \text{ mL/hour} = 3.4 \text{ microgram/kg/min}$$

$$3.4 \text{ mL/hour} = 5 \text{ microgram/kg/min}$$

Start the infusion and titrate as required.

3. Use this formula to calculate the "Actual Rate"

What flow rate gives a dose of 8 microgram/kg/min (required dose)?

(colour coding may assist you)

$$\frac{\text{Required Dose} \times \text{Default Rate (mL/hour)}}{\text{Suggested Start Dose}}$$

$$\text{Actual Rate (mL/hour)} = \frac{8 \times 3.4}{5} = 5.44\text{mL/hour}$$

Example of rate calculation using Individualised Weight-based Concentration Infusion

A 6kg patient with a Central Venous Catheter is prescribed a Noradrenaline infusion

1. Calculate the individualised weight-based formula as per table

$$0.3\text{mg/kg in } 50\text{mL}$$

$$0.3 \times 6 = 1.8\text{mg in } 50\text{mL}$$

2. Prepare a 1.8mg/50mL final volume* NaCl 0.9%w/v

(*Final volume = Neat medication volume + Diluent volume)

For this infusion:

$$\text{Noradrenaline } 1\text{mg/mL} = 1.8\text{mL}$$

$$\& \text{ NaCl } 0.9\%w/v = 48.2\text{mL}$$

$$\text{Final volume} = 50\text{mL}$$

3. When run at 1mL/hour this infusion gives a dose of 0.1 microgram/kg/min

Disclaimer: Every effort has been made to ensure the information is accurate and up to date and CHI or IPATS cannot accept any legal responsibility for any errors or omissions. Differences in available drug preparations, and the manner in which concentrations are expressed, can produce minor discrepancies in final concentrations and calculated flow rates. In recognition of the need to stabilise children, other settings/hospitals may refer to this table but are solely responsible for all acts or omissions carried out in connection with, or in reliance on, the material provided.